Agricultural Development and Starvation in the Sudan

by

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Occasional Paper Series in Irish and World Development

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Introduction

Like many other underdeveloped countries, Sudan perceives its future in agriculture. This perception is not a product of recent development thinking. Rather, it is the same view as that which guided colonial economic and development policies in the Sudan. Agricultural development was also the foundation for policies of successive national governments which ruled the country since its independence in 1956. Ironically, and despite massive expansion in the Sudanese agricultural sector, the country now enjoys no better future prospects than what it had during the latter years of its colonial history. This article argues that the pattern of agriculture adopted in the Sudan, indicative of its development strategies, is primarily responsible for its present state of underdevelopment. While agriculture still remains the only viable road for progress, that cannot be achieved without fundamental political, cultural and economic re-orientation with far reaching ramifications. Needless to say, such changes are bound to have some international repercussions as well as internal and external resistance.

Sudan's agricultural development

The colonisation of Africa resulted in the restructuring of its economic, political and social fabric. Most importantly, the changes have led to the articulation of its economies into those of the colonial powers. Economic production was to undergo profound changes to serve the economies of the colonising powers. Thus, palm oil was to feed western soap industries, cocoa the chocolate industries and cotton was to feed the western textile industry. Such articulation meant that these African economies were to form -for good- an essential component of the world economy, a process which by definition went against self sufficiency in food and other necessities. The economies which were up to then primarily geared towards internal needs became largely oriented towards meeting outside demands. It is important to add here that the integration of the economies of the colonised nations into the metropolitan domains was fostered by a host of other social and political restructuring:

"So successful was this process that the termination of formal colonialism nowhere led to radical change in the relationship between formal colonies and metropolitan interests, at least at the level of the economy" (Sawyerr 1990:10).

The Sudan is a classic example of this process. It was regained by the British in 1898 and continued as British colony until its independence in 1956. The two decades following the reoccupation of the Sudan proved most difficult for the textile industry in the British empire. Lancashire textile industries were coming under increasing competition from the far east for cotton:

"Now under pressure from foreign competition, the most explicit rationale for the development of the Gezira can be detected in debates in the British Parliament in 1913....., where Lancashire MPs expressed the need for policies which benefit Lancashire.....(Barnett and Abdelkarim 1991:4, Barnett 1977:5).

Thus, the Sudan was subsequently chosen to bail out the British textile Industry. After long and albeit successful experiments, the area between the two Niles, south of their confluence at Khartoum, saw the start of the biggest cotton scheme of its time. The scheme came into operation in 1925 and since then became known as the Gezira Scheme. The Scheme continued with almost the same structure after independence giving supremacy to cotton production. Paradoxically, the Scheme which was originally established to serve British interests, was later retained to serve the interests of independent Sudan. Thus, the interests of the British colonial power and that of independent Sudan were held to be synonymous. The preservation of the Scheme structure and its export orientation was later consolidated by horizontal and vertical expansion. The Managel Extension was added to the Scheme in 1958 and the agricultural intensification was adopted in 1974/5. Present visitors to the Gezira Scheme HQ are told with extreme pride that it is the "world's biggest agricultural scheme under a single management"; that it occupies 2 million acres and supports over 100,000 tenant households and over one million workers". The pertinent question, however, is how successful the Scheme is in sustaining its people and how useful it is for the country as a whole? While orthodox developmentalists hail the Scheme as a success worthy of preserving within its present structure, the Scheme is coming under increasing criticism from many who have different understanding and espouse alternative development strategies.

After nearly seventy years of existence, the Scheme has not been able to develop an internal dynamic of self sustenance. The Scheme has faced near collapse several times in the last few decades only to be bailed out by external injections of cash, notably from the World Bank and other similar financial institutions. The so called Rehabilitation of the Gezira Scheme launched in the 1980s by the World Bank is a case in point. Such rescue programmes are costly and have negative impact on the country's external debt. Moreover, they fail to address the issue of sustainability of the Scheme and hence its dependency on the outside world. Paradoxically, each rescue programme contains its own conditions whose prime implication is a further entrenchment of the Scheme in the international economy and a consolidation of the its subordinate position.

At the moment, the Scheme contributes around 50% of the country's export revenue. Cotton for which the Scheme is central contributes over 40% of total export earnings (Coote 1992:6). As such, the performance may look remarkable. Yet, the Scheme is responsible for diverting huge capital, expertise and effort which could have been more beneficial for the country as a whole in other sectors. Indeed the profitability of the Scheme has been questioned by many scholars.

Early years of the Scheme resulted in substantial improvement in the farmers' standard of living. The situation is now different. A recent study indicates that the Scheme is failing to provide bare subsistence to a substantial proportion of its farmers: "The Gezira tenants on average obtain only 39% of their income from farming activities" (Barnett and Abdelkarim 1991:95). The rest of the income is earned on off-tenancy activities which are discouraged by the administration of the Scheme. The problem is accentuated by the lack of realism of the Scheme administration and its obsession with cotton production as against food crops. In plain language, the Scheme is locked into a division between administration and tenants; each with its priority. While cotton is the most important crop to the Scheme administration, it is food crops which are vital for the tenants. In this, the tenants are far from acting on the basis of erroneous "peasant economics" with its alleged obsession with subsistence crops:

> "It has been apparent for some time, that from the point of view of the individual tenant household, the cultivation of cotton is at best a marginal proposition. In many cases the tenants have experienced constant losses. Their faith in the profitability of cotton has declined. Their response to this realisation has been to do only the minimum necessary to ensure the annual renewal of their tenancy, safeguarding their access in the next season to land for their other profitable crops - notably dura and groundnuts" (Barnett and Abdelkarmin 1991:95).

The unattractiveness of Scheme work in general and cotton in particular has precipitated an increased reliance on hired labour. This contradicted the original plans that most of the agricultural operations will be carried out by tenants' household labour. It is estimated, for example, that "fewer than half of all tenants are still directly involved in farming, and only 15 percent of the overall labour requirements are met by tenants and their families (Kontos 1991:154). It is also noted that cotton absorbs 52.8% of all labour inputs while it consumes 59.8% of all non-household labour inputs to all crops (Barnett and Abdelkarim 1991:45). The level of frustration with the level of income in the Scheme has resulted in the farmers failing to reproduce themselves as tenants. This is indicated by increased reliance on hired labour and by the fact that children are encouraged to gain skills that help them to move out of the Scheme. That however is hardly a headache for the Scheme HQ as absentee tenants can easily be replaced by impoverished agricultural workers who are destined by the Scheme policies and the socio-economic structure of the country to remain landless and hence eager sellers of their labour. Nonetheless, the alienation of the Scheme tenants is a serious problem which merits urgent consideration.

The dissatisfaction of the tenants with Scheme work has other sides with goes beyond simple optimum labour allocation. The Gezira Scheme is one of the most unhealthy parts of the Sudan. Continuous irrigation coupled with lack of prioritisation of health or of human being has made the entire Scheme a host for numerous diseases. Malarial and diarrhoeal diseases, fevers and schistosomiasis are rampant in the Scheme. The level of infection of schistosomiasis reached 80% in some villages in the 1980s. To this one may add the damage to the health of people caused by various chemicals used as herbicides, pesticides, and fertilizers. The fact that the Scheme combines edible and non-edible crops, planted side by side, makes the use of chemicals hazardous. The low priority accorded to people in the Scheme makes it impossible to assess the extent of the hazards of such chemicals to human health. Gezira Scheme researchers and professors are capable of compiling impressive graphs showing, mortality, fertility and number of geckoes, lizards and spiders per acre. These predators are important as they feed on pests which may pose some threat to cotton. Yet, it is difficult to find any statistics pertaining to death or damage to health of tenants and workers who use and work in this unhealthy environment.

The Scheme has also unleashed a new official culture which is detrimental to the environment. A visitor to the Scheme will be bewildered by the absence or scarcity of trees in or around the farms. Trees are eliminated from around farms in order to prevent the obstruction of machinery and perhaps inspectors' vehicles. Like trees, animals also do not fair well under the Scheme's administration. The hitherto mixed pattern of agriculture whereby nomads combined cultivation of crops with animals husbandry was too primitive for the modern Scheme to preserve. Instead, laws were enacted, although to no avail, to ban or discourage the farmers from keeping animals like goats, sheep and cows. Farmers had to keep some animals in their desperate attempts to diversify their sources of income. The Scheme has recently come under pressure favouring the inclusion of animals in the Scheme and a much less powerful campaign regarding reforestation.

The Gezira Scheme provided a model in the country for other schemes which relied on continuous irrigation. Thus, in the sixties, the Khashm El-Girba Scheme was established only to be followed by the Rahad Scheme in the 1970s. While some attempts have been made to make use of the lessons learnt from the Gezira Scheme, the degree of success has been severely limited by lack of experience and perhaps lack of commitment. This is certainly true with regard to forestation and the incorporation of animals into new schemes. The new schemes however shared with the Gezira Scheme the absolute commitment to cash crops, cotton and other export products.

The seventies also witnessed the move into sugar cultivation and production, the dual aims being to augment the export sector and equally to relieve the import sector. The pride of the sugar production is currently represented by Kinana Sugar Scheme at the While Nile; better known as Kinana Sugar Company (KSC). The Scheme was originally sold to the Sudanese people as the would be model of rural development, a transition to self sufficiency in sugar and the inauguration of Sudan as a sugar exporting country. Indeed the whole package was propagated within the then widely publicised myth of Sudan as "breadbasket of the Arab world". Self sufficiency in sugar and presumably saving of hard currency soon proved to be another myth. Sudan's shares in KSC dropped from 60% at the feasibility stage in 1975 to around 40% in 1983 which was barely two years after the start of operation (Hassaballa 1987:27,35). This is illustrated by the deal which stipulates that half of the annual production (around 150,000 tons) would be exported and the other half would be sold to the Sudanese government at the gate of the factory in hard currency (Ibid:35). For the average Sudanese family, the late 1980s and 1990s have witnessed the removal of sugar from their diet as its price has risen by several thousand per cent. The KSC also proved a good lesson for exponents of large scale production and its assumed efficiency. Early production costs in the KSC were higher than average African production and the other four sugar Schemes in the country which were/are much smaller in size (other Scheme are New Halfa, Sennar, Hajar Assalaya and El Genied, see Fadl and Bailey 1984:5). The author is unable to assess the result of recent rehabilitation of the Scheme (Ibid:42).

Like many giant agricultural projects in the Third World, the KSC turned out to be counter productive as far as the indigenous people are concerned. These are nomadic (Kenana) people who , for centuries, practised animal husbandry coupled with shifting cultivation in the present location of the Scheme. Through the usual stick and carrot polices, 40,000 of them were successfully removed to make room for the Scheme. With the exception of the embarrassingly mean compensation which they got, almost all other promises made to them did not materialise. In his study of the Scheme, Hassaballa reported that "a family of seven persons, owning 3 huts and ten feddans [feddan = 1.038 acres = 0.42 hectares], has been compensated approximately LS£8.00 ($20) once and for all" (Ibid:38). Adopted employment policies dealt a final blow to those nomads as KSC resorted to importing labour from outside the area on the grounds that nomads have poor tolerance for the Scheme's laborious work. The actual fact is that migrant workers, specially from west and southern Sudan are less vocal in guarding their rights and are not backed by a powerful urban lobby. As such, they are more amenable to more effective exploitation by the Scheme management.

Altogether, the Sudan devoted 4 million acres of its most fertile land to what came to be termed the modern irrigated sector. This sector is characterised by continuous irrigation, use of modern agricultural equipment and other inputs and concentration on cash crops.

Rainfed mechanised agriculture

The modernisation of agriculture is also extended to areas which have not been brought under all-year-round irrigation. This is what is termed Mechanised Farming System/Sector (MFS). This sector was started in the 1940s, became open to Sudanese investors at Independence but only came to its full force in the 1970s. Like the previous irrigated sector, emphases were laid on mechanisation presumably to make it more efficient and/or to avoid shortage of labour. This sector in particular is heavily influenced and financed by international financial and developmental institutions led by the World Bank. Designated areas, mostly in central and eastern Sudan, were to be divided into individual plots of 1000 cares each. Procedures followed in the allocation of these plots proved most disadvantageous to the poor:

> "Conditions put forward by the allotment committee were that the applicants should own, or should have enough financial resources to buy a tractor, a disc and a planter, should have sufficient resources to finance the agricultural operations and also, according to the judgement of the committee, have the entrepreneurial ability and time to manage a large farm" (Abdelkarim 1992:62).

The outcome is obvious. Peasants who previously occupied the land were subsequently relegated to an agricultural proletariat operating farms owned by rich farmers, merchants and top bureaucrats.

While this sector has contributed substantially to both export and local consumption, its drawbacks are difficult to ignore. The immense power of the investors in the rainfed agricultural sector succeeded in making a mockery of government agricultural regulations. According to some sources, the 6 millions acres designated by the government to this sector were soon extended - illegally - by at least 2 million acres. Unlike the peasant mode of agriculture, the new capitalist merchants have no enduring relationship with land and hence the preservation of its fertility is not among their priorities. If necessary, depleted land can be replaced by newly cleared plots with or without permission. Moreover, investment in agriculture is often seen in this sector as a short term investment and a platform for moving into more lucrative urban investment. Subsequent research has proved that under this pattern of agriculture, production declines substantially within a few years of the start of cultivation. Instead of using the established methods of land preservation such as crop rotation, artificial fertilisation or fallowing, it proved more expedient for many farmers to move to a new land. As expressed by some researchers, horizontal expansion became a feature of this sector while vertical expansion is far beyond simple contemplation (Abdelkarim 1992:77, Gurdon 1991:21). This process is responsible for continuous eradication of trees with detrimental effects on the environment. The expansion has also primarily taken place at the expense of the powerless peasant pastoralists who had traditionally used this zone in their annual migration (Ibid:72, see also Clark 1986:14).

The outcome

Altogether, the Sudan devoted around 12 million acres to modern farming (see Table 1). With a population of 24 million, the allocation of modern agriculture for each Sudanese stands at 0.5 acre. Modern agriculture has occupied the most fertile land in the country. Nonetheless, the Sudan is now among those countries in which famine occurs once every three years. If there is any lesson to be learnt from the experience of the Sudan, it is the fact that modern agriculture provides neither a base for development nor guaranteed food security. This is also due to the prohibitively high cost of this pattern of cultivation coupled with its severe disruption of the process of food entitlement in the country. The situation was well articulated by a economist who reported during the famine of 1984/85 that "modern agriculture collapsed several times without any substantial food problem in the Sudan. The moment the traditional agriculture collapsed presumably due to drought, the Sudan was reduced to a nation of beggars". Ironically, it is the modern sector which has attracted the bulk of the efforts of Sudanese developmentalists with the nation duped into believing that the country would soon become the "breadbasket of the Arab World!". This myth echoed the international conventional approach to development and hence there was no shortage of financial support:

	Table 1 Cultivated land by sector in the 1980s	
Cultivated Sector	Area Cultivated	% of Total Cultivated land
Traditional Sector	10,500,000	50.8%
Irrigated Sector	4,250,000	20.5%
Mechanised rain-fed	5,934,000	28.7%
Total	20,684,000	100%

(Source:Adapted from Barnet and Abdelkarim 1992:15; Table Excludes illegal cultivation)

"International lenders and oil-rich Arab investors poured more than $2 billion into Sudan's agricultural sector between 1975 and 1985, yet, during the this period, its farm productivity declined" (Kontos 1991:137).

As far as attracting foreign finance was concerned, the sudan and its elite could not have had it any better. Not so much its poor. Not surprisingly, the country amassed an astonishing amount of debts that simply cannot be paid, nor identified. The Minister of finance of the post-Nimeri Interim Government declared to the public that records of debts were so chaotic that the government could not determine how much the country owed its creditors (cf. Ali 1985:14). At the moment, Sudan's total debt stands around $16 billion (for different estimates see Gudron 1991, Abu Affan 1991, EIU 1991 and Lesch 1991). Sudan has lost its total annual export revenue and entered the 1980s as a decade of net transfer to creditors:

> "The net transfer to the international community from Sudan as a result of these terms was $52.9 million in 1983, when the total debt burden for disbursed debt was equal to 700 per cent of export earnings" (Gurdon 1991:29).

A similarly ominous picture was presented in a different source:

> "The total external debt of the Sudan reached $11.6 billion by the end of 1987, with debt service obligations equal to 13.6 percent of GDP and 115 percent of exports of goods and services" (Abu Affan 1991:11).

In a nutshell, Sudan cannot possibly pay its debt out of its limited export revenue (see graph; allow for necessary import costs). Three possible options are now available to the Sudan: "defaulting, continuous rescheduling or writing off some part of *(its)* debts" (Gurdon 1991:29). Ironically, it is the fist option on which Sudan can have a say; a choice which relegates the country to an international outcaste -not to mention other consequences. The other options are determined by outside partners.

The present economic problems of the Sudan outlined above are primarily a product of the pattern of development which it has opted to adopt. This pattern which is in line with the conventional approach to development assumes the model of export propelled economy. While Sudan is basically similar in its development history to the

majority of "Third World" countries, it diverges from many of them on the basis of its unique relationships with international "development" institutions. The late seventies coincided with the IMF's plans to co-opt a poor country for use as a model for development primarily through removal of exchange controls accompanied by heavy technical and financial assistance. Although the Sudan failed to convince the IMF to use it as a test-case for its hypothesis, it has followed it and/or its sister institutions obediently though without the full benefit of the IMF's package. This is presumably what led an eminent Sudanese economist to brand the country as the IMF's "pilot farm" in Africa (Ali 1985a). In particular, the Sudanese economy was effectively run by the IMF with the president of the country assuming the role of announcing its harsh and albeit unsuccessful measures (see Ali 1985:3, see also Safwat 1988:13, Ali 1985a). The failure of these policies has meant that the Sudan has become a victim of the conventional approach to development and its enshrined doctrine of international division of labour. Following this doctrine, the Third World countries should concentrate on the production of raw materials in which they have a comparative advantage, while western countries devote their productive capacity to manufactured goods. Lappe and Collins expressed this for their American readers:

> "Didn't all of us learn in junior high school how natural it is that Pedro's family in South America can grow coffee for us while we in turn can export the industrial goods his country needs and that in a world of unhampered free trade we all win?" (Lappe and Moore 1986:77).

In reality, and because of other mechanisms as well, the Americans win but Pedro's country -simply and in short- doesn't. It is however this very philosophy which many Third World leaders are led to believe. The quotation also highlights another fallacy: that it is nature which placed coffee in Latin America and industrial goods in America. Or to push it to its absurdity, it is nature which placed sugar in Jamaica, cars in Japan and arms in USA!. The theory of comparative advantage and the myth of free trade as advantageous to all are relatively new in economics as a science. Prior to that, British economists subscribed exactly to the opposite theory. Historical evidence shows how the British empire protected its textile economy against the then more advanced Indian industry. The protectionist policy was described as a "complete success" and was only reversed after British preeminence over others was achieved (Hayter 1981:50-51). Various tactics were used in the process including the banning of importation of any textile products into the British Isles and the destruction of the Indian and later the Egyptian textile Industry. Quoting Cippola, Hayter notes:

> "It is fortunate for England that no Indian Ricardo arose to convince the English that, according to the law of comparative costs, it would be advantageous for them to turn into shepherds and to import from India all the textiles that were needed" (Hayter 1981:51).

The pattern of development in the Sudan has left the country with a deformed economy. This economy is primarily based on two agricultural sectors. A modern sector which is relatively dynamic and developed is geared towards outside needs but intricately tied with the interests of internal elites and rich sectors of the population. The other sector of the economy is composed of traditional agriculture. This is the most neglected part of the economy though it is the sector most responsive to internal needs. While the former sector is mostly dominated by cash crops, the latter is marked by its food and subsistence orientation. Moreover, the modern agricultural sector is a huge burden to the state while the traditional sector has been performing with a near-zero cost. The two sectors are far from co-existing within a symbiotic relationship. Instead, they are competing against scarce resources. Cash crops, the main generator of hard currency are the obsession of both the Sudanese planners and their external advisors. The most fertile land in the country is already allocated to cash crops. So also is capital and labour. Sudanese scholars have estimated that 60% of Sudan's agricultural labour is devoted to cash crops. The same pattern is also found in other comparable African countries. Kenya devotes 78% of the its agricultural labour to cash crops. Senegal allocated 55% of its land for its primary cash-crop peanuts. In the drier years of mid 1980s, Oxfam reported that Guinea Bissau banned the local sale and thus consumption of peanuts in order to maintain its exports to EC countries. Groundnuts were fed to the dairy cattle of the EC contributing to milk surplus, some of which goes back to Guinea Bissau as food aid (CIIR 1985:16-17). Not surprisingly, food self sufficiency declined in all African countries.

For Sub-Saharan countries, food self-sufficiency is estimated to have declined from 93% to 29% in the last 30 years. Quoting a different source and starting from a different base, "food self-sufficiency in SSA has dropped from 98 per cent in 1960 to 8% in 1986" (Sawyerr 1990:5). Disregard for food production is maintained even during famines in Africa. During the great African famine of 1985, Nimeiri, the then president of the Sudan, ordered the management of the Gezira Scheme to stop irrigating wheat and diverted the scarce water to cotton. While it is justified to say that the modern agricultural sector in the Sudan has contributed to food production, the process has been accompanied by reduced accessibility of the majority of the population to what is produced. This is precisely why the Sudan exported grain to the Saudi camel and beef industry during the famine of 1984/85 while it continued receiving emergency food aid from abroad.

The underdeveloped countries have shown a remarkable dedication to the doctrine of comparative advantage and a firm commitment to production of raw materials. Nonetheless, many of them have conceded defeat as they have lost the trade battle for good. Indeed they have been running very fast only to stand still if not to move backward. This is due to many factors, most important of which are the terms of trade whose control lies in the rich north. The cotton produced in the Gezira Scheme, Sudan, is priced and sold several times over, long before it is harvested. Rather than taking place in Sudan, the sale of cotton is determined in stock markets in London, Washington, Tokyo and other similarly powerful trading centres. The result is a differential change in prices of raw materials and manufactured goods which is generally against the interests of the underdeveloped countries. In fact, many scholars maintain that if prices had remained at the 1970s level, there would be fewer debt problems in these countries. In 1970, a tractor cost Tanzania 40 tonnes of sisal. A similar tractor cost the same country 220 tonnes of the same produce in the late 1980s. Zambia where copper accounts for 88% of its exports had similar misfortune. The prices of copper fell by 60% in real terms between 1964 and 1984 (CIIR 1985:11-12, CIIR 1987:8). Despite accusations of mismanagement, inefficiency and corruption, the performance of the poor countries is indeed impressive. Notwithstanding, this has proved detrimental to their very interests. Third World people have worked so hard that they have exceeded world demand in cotton, coffee, tea, bananas, sugar, palm oil, rubber, jute, etc. At the height of 1985 famine, Sudan's unsold cotton stock was estimated to be worth $600m. The stock was later sold later at a give-away price in 1986 (EIU 1990-91:19). That wasn't the first shock for Sudan which was also counting on benefiting from its newly expanded sugar Industry. Two years earlier, the then EEC dumped nearly 5 million tonnes of beet sugar at cost of over £600m in export subsidies. The result was a fall of 50% in sugar prices to the outrage of African cane sugar exporters (CIIR:1985:12). Sudan's miserable story is yet to be fully told:

> "For Sudan's major export commodities, prices declined over the period 1970-1982 at annual rates of 4.1% for groundnuts and livestock and 1.9% for cotton...... The decline in world prices for key exports goods together with rising import prices, led to a decline in Sudan's net barter terms of trade between 1980 and 1982 of over 30 per cent" (Ali 1985:12. See also World Bank 1983).

Third world producers do not only compete against each others, they also face tough competition from the western bio-technically engineered substitutes. Products threatened by these substitutes include sugar, rubber, jute, cotton, timber, coffee, cocoa and the list continues to grow unabated (See George 1989:60).

Conclusion

Sudan is one of those countries which has accepted the dogma of pursuing development through an export propelled economy based on primary products. It has also accepted the dogma of concentrating on an agricultural sector which is capital intensive, technologically modern and capitalist orientated. Technologically speaking, the Sudan jumped the evolutionary ladder in its agricultural development: from the stage of primitive hoe and axe agriculture straight to that dominated by combustive engines. The result is a modern agriculture sector which is expensive, unsustainable, dependent on the outside and detrimental to the majority of the country population. Whether this road is a product of false perception of development or enforced by outside power is a subject of a different

debate. What is clear is that capital and technologically sophisticated modes of agriculture meant that the Sudan has been relegated to the service of the few to the exclusion of the many. Examples of successful introduction of appropriate technology affordable to the poor are scanty but not nonexistent. In 1985, the author visited a remote village in western Sudan where farmers were experimenting with a newly introduced plough. The plough was an offspring of two others; one was brought from northern Sudan and other was introduced by the government's Agricultural Extension. The original ploughs were huge and powered by several bulls. As such, they could not be afforded by the poorest sector of the community who formed the majority of the farmers in the area. A local black smith took over the idea and modified the plough. His new plough which was made of scrap metal appeared in several versions. The most expensive one was designed to be drawn by a camel and was intended for the relatively better off farmers. The version for poorer farmers can be drawn by a single donkey and was sold at the time for LS£35 (roughly LR£10 to 12). Nonetheless, this version was estimated to be 8 times more efficient compared to traditional hoe land tillage (El-Tom 1985). Despite its primitiveness, this type of technology has its advantage over modern imported tractors. It is accessible to the poor, sustainable within local resource and technical knowledge and above all does not generate dependency on the outside. Another similar example can be drawn from Jaba Mara Rural Development Project (JMRDP) and Nuba Mountain Rural Development Project (NMRDP). These are governmental projects but have also received finance from the EC countries. Both projects provided simple ploughs on credit basis in the mid 1980s. The JMRDP was able to reach 350 villages thus benefiting 50,000 households. The NMRDP was able to reach 3000 households at the time of the study. The most impressive aspect of the projects was the rate of credit repayment. During the dry years of 1983-1986, the former reported a repayment rate of 50% to 80% while the latter's rate was 70% to 80% (author regrets inability to recall exact source of the above information). The success of repayment destroyed the myth of the poor "peasants" as cheats, unreliable and mostly uncredit worthy.

On the basis of the above experience, there seems to be little option for Sudan but to abandon its present pattern of development. This is not simply necessitated by the need to meet the demands of its population but equally by the unsustainability of its present mode of development. Fundamental restructuring of the economy making it more responsive to internal needs is vital. Yet, this can only be pursued through the application of affordable lower level technology. It is imperative to stress that such changes necessarily entail corresponding socio-political rearrangements. Though beneficial to the masses, development by means of lower technology is detrimental to the interests of Sudanese elites, merchants and rich farmers. Externally, such changes are bound to upset Sudan's position within international trade, investment and debts repayment and is thus bound to be opposed by guardians of the present world economic order, notably the multilateral institutions like WBRD, IMF, Paris Club, etc. Finally, if Sudan's agriculture is to continue to lead its economy, and if moving towards appropriate and affordable technology is a move backward, then it is indeed the primitivisation of Sudanese agriculture which forms the essence of what this paper advocates.

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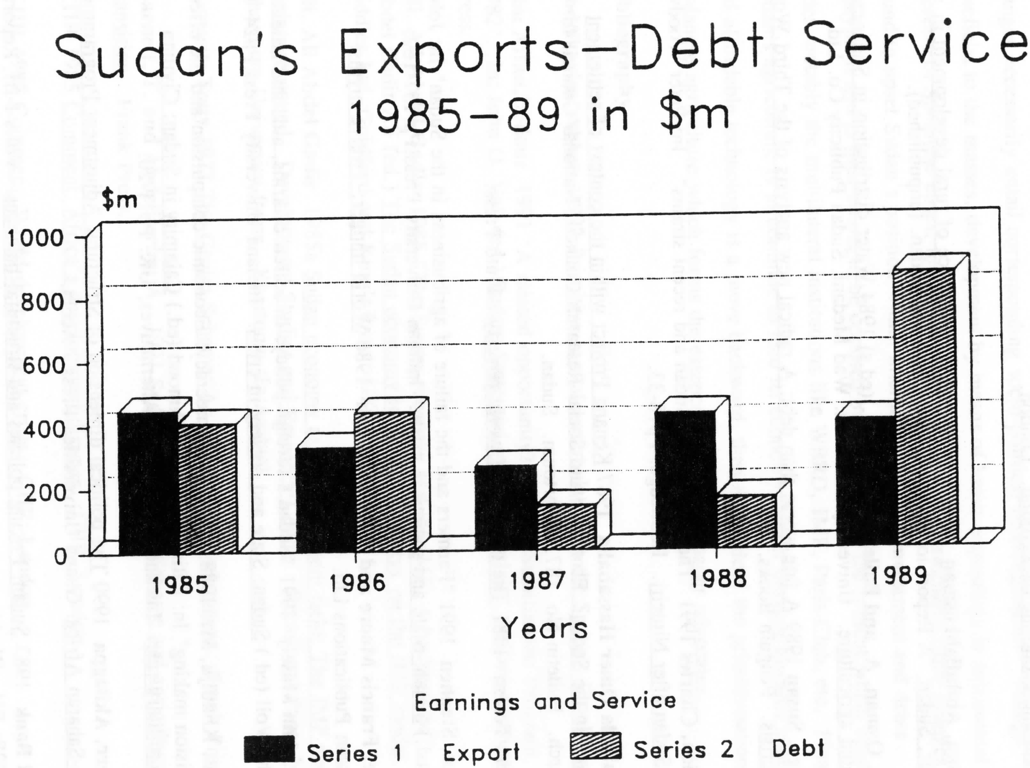

GRAPH 3

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